

Allotment Management Plan

Pine Creek Allotment

December 2008

1. Introduction

This Allotment Management Plan (AMP) was developed following a Decision Memo for the Pine Creek Allotment signed by Martie Schramm, Williams District Ranger, in September 2008.

The Pine Creek Allotment is located on the north edge of Williams, Arizona. The Williams Airport is located near the middle of the allotment and is surrounded by a chain link Fence that excludes livestock and most wildlife species. It contains approximately 8,374 Forest Service acres; approximately 4,410 acres of grassland, 580 acres of pinyon/juniper, 2,810 acres of transition pinyon/juniper/ponderosa pine, and 570 acres of ponderosa pine. Elevations range from 6,500 to 7,400 feet.

2. Desired Conditions (Goals and Objectives)

The overall desired condition is maintenance of sustainable ecosystems within and surrounding the Pine Creek Allotment, in which livestock grazing does not impair important ecosystem functions, such as maintaining soil stability and productivity, and maintaining vegetation diversity and productivity.

Specific desired conditions that apply to the allotment include the following:

Vegetation

- Total herbaceous plant cover trends mirrors or improves upon trends in livestock excluded areas.
- Provide for a diversity of cool and warm season plants. Cool season plants trends mirrors or improves upon trends in livestock excluded areas.
- Protect Threatened, Endangered, and Sensitive plant species from adverse effects caused by livestock grazing and grazing management activities.
- Eradicate or control as many existing populations of noxious weeds as possible and prevent new introductions of noxious weeds caused by livestock management activities.

Soils

- Minimize erosion caused by livestock grazing and grazing management activities by maintaining soil condition and bare ground that mirrors or improves upon trends in livestock excluded areas.
- Total litter cover trends mirrors or improves upon trends in livestock excluded areas.

3. Background

Livestock grazing has occurred within the area since the late 1880's. Permitting began around 1905 with the establishment of the National Forests. No specific documentation is available regarding the type and number of livestock grazed Forest-wide in the early years, but general historic observations indicate that livestock numbers were high. The allotment has had the same permitted number of livestock and season of use since 1987. The current grazing permittee has held the permit on this allotment since 2001.

Current permitted use for the Pine Creek allotment allows up to 250 head of yearling cattle or the equivalent of 133 adult cattle (cow/calf) from June 1-October 31 (154 days) which equates to 886 Animal Unit Months (AUM's) and 1,266 Head Months (HM's). Allotment management follows a three pasture deferred rotation grazing system.

The grassland is dominated by blue grama, with bottlebrush squirreltail and mutton bluegrass present. The topography is gently rolling hills and there are no major canyons or riparian areas exist. A seasonal wetland, Three Mile Lake, and one intermittent stream, Upper Cataract Canyon is within the allotment. Dogtown Wash is a major drainage running through the allotment.

Differences exist between the potential natural community and the existing vegetation as the result of tree encroachment, historic livestock grazing, drought, and climate change. Ponderosa pine, pinyon, and juniper trees have encroached into the grasslands, competing for available nutrients, moisture, and sunlight. This trend has been attributed to a combination of climatic shifts, control of fire, and grazing. Cool season grass species have been replaced with the warm season blue grama. This trend is seen throughout the Williams Ranger District, and is attributed to the shift in climate.

Actual use has varied primarily due to drought, adaptive management, or ranch objectives. For example, since acquiring the permit in 2001 the current permittee has run cattle once, in 2002. The previous permittee ran full numbers from 1987 through 1999 and took non-use in 2000 (see Table 1). A temporary permit was issued for the winter of 2003. Permitted cattle numbers, under the current grazing management system, fall within the carrying capacity of the allotment (47% of current estimates). Carrying capacity for this analysis is based on: actual use data, condition and trend monitoring, livestock and wildlife use patterns, livestock health and condition, soil surveys (Terrestrial Ecosystem Survey), forage production estimates, and professional opinion.

The trend for Pine Creek Allotment is static or stable for range condition since the 1950's. The trend is up for soil condition since the 1950's. Trend in range condition is down since 1983, while trend in soil condition is up. The percentage of bare ground has gone up since the 1950's in the clusters, but down since 1983. Plant cover is generally upward since the 1950's. Since 1983, grass cover is up because of an increase in blue grama but cool season grass cover is down. A reduction in cool season grass species is following trend found throughout the Forest in grazed and ungrazed areas. The cool season grass reduction is most likely caused by a decrease in winter moisture and an increase in warm season grasses.

Five monitoring transects were established on the Pine Creek Allotment in 1950. They, along with two pace frequency transects were read in 2007. The results of this monitoring indicate either a static or upward trend.

One of the Parker's, C5, was established in a livestock enclosure in 1957 and remains to this day. This enclosure gives us a good comparison of grazed versus ungrazed rangeland as well as serving as a control plot for species composition.

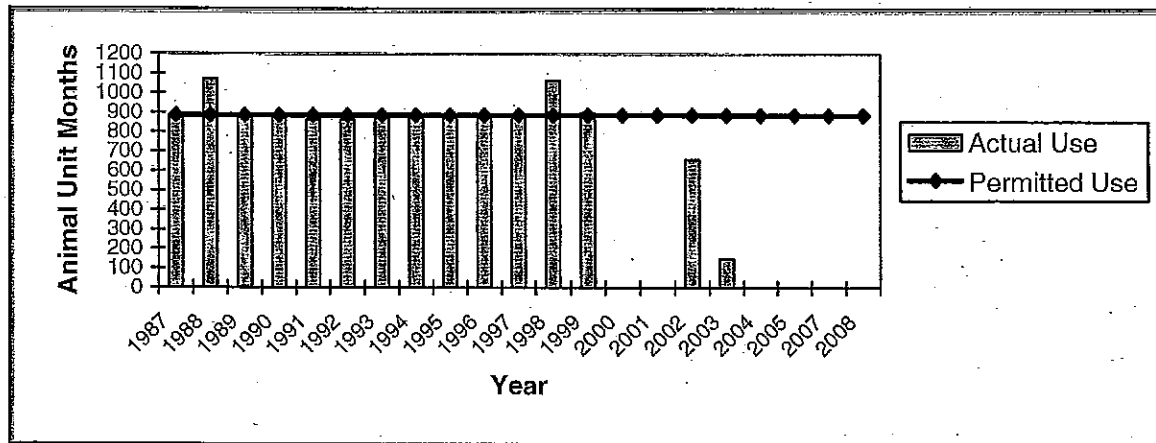
These range condition trends exist under the current livestock grazing system and within the current utilization guideline for livestock and wildlife. Grazing has remained within this utilization guideline and livestock have been able to use the area for the full length of the grazing season.

Table 1. Pine Creek Allotment Actual Use, 1989-2008

Year	Number	AUMs
2008	0	0
2007	0	0
2006	-	-
2005	0	0
2004	0	0
2003	76	150
2002	162	660
2001	0	0
2000	0	0
1999	250	897
1998	250+50 temp.	1063
1997	250	886
1996	250	886
1995	250	886
1994	250	886
1993	250	886
1992	250	863
1991	250	863
1990	250	892
1989	250	892
1988	250+50 temp.	1070
1987	250	881

Between 1987 and 2008, actual use ranged from zero to 300 cattle, with the allotment fully stocked (actual AUMs equal to permitted AUMs, 886) in 13 of those 22 years (Figure 1). Reductions in stocking levels were primarily in response to drought conditions.

Figure 1: Pine Creek Allotment Actual; 1989 through 2008



4. Current Conditions

Monitoring data were evaluated by a Kaibab National Forest interdisciplinary team to assess changes in range conditions on the Pine Creek allotment. Data were available from five Parker Three Step transects (Parker transect), two paced transects, and Terrestrial Ecosystem Survey (Forest Service 1991). Parker transect long-term monitoring data was collected in 1952, 1957, 1967, 1977, 1983, 1996, and 2007. Paced transect data were collected at two sites in 2007 to supplement the Parker transect data. Terrestrial Ecosystem Survey data were collected between 1979 and 1986.

Vegetation: The Pine Creek Allotment is dominated by 4,410 acres of grassland, 2,810 transition acres of pinyon/juniper/ponderosa pine, 580 acres of pinyon/juniper, and 570 acres of ponderosa pine forest. The average vegetation condition score was 25 (Poor) in 1952, 22 (Poor) in 1957, 53 (Fair) in 1967, 57 (Fair) in 1977, 45 (Fair) in 1983, 37 (Poor) in 1996 and 32 (Poor) in 2007 (see Table 2). Monitoring data indicates that cool season grasses such as bottlebrush squirreltail declined since the 1960's, while blue grama, a warm season grass, has remained stable or increased slightly.

Soils and Watershed: The allotment is dominated by grassland and savannah soil types (Mollisol soil order or mollic subgroups). Soil condition scores averaged 21 (Poor) in 1952, 22 (Poor) in 1957, 66 (Good) in 1967, 49 (Fair) in 1977, 48 (Fair) in 1983, 61 (Good) in 1996 and 71 (Good) in 2007. Bare soil declined (an improvement) from a high of 48% in 1983 to 24% in 2007 (see Table 3).

Table 2. Vegetation condition scores determined on Parker transect and paced transects within the Pine Creek Allotment

Soil Map Unit	Transect	1952	1957	1967	1977	1983	1996	2007
507	C1	27	24	65	66	58	53	37
507	C2	23	23	57		49	35	27
514	C3			48		37	27	28
507	C4		24	56		29	26	34
507	C5 - Exclosure		22	57	47	53	43	32
565	P2							37
563	P3							26

Condition scores correspond to the following ratings:

Very Poor = 0-20; Poor = 21-40; Fair = 41-60; Good = 61-80; Excellent = 81-100

Table 3. Soil condition scores determined on Parker transect and paced transects within the Pine Creek Allotment

Soil Map Unit	Transect	1952	1957	1967	1977	1983	1996	2007
507	C1	19	22	63	53	58	75	61
507	C2	22	24	75		54	69	71
514	C3			58		38	58	41
507	C4		22	73		35	47	77
507	C5 - Exclosure		22	58	45	57	58	69
565	P2							77
563	P3							98

Condition scores correspond to the following ratings:

Very Poor = 0-20; Poor = 21-40; Fair = 41-60; Good = 61-80; Excellent = 81-100

Changes in the density and diversity of cool-season perennial grasses are important factors in evaluating range condition and trend. On the allotment, impacts from drought periods occurring after 1985 and changing precipitation patterns (drier winters and springs, late monsoons) are believed to be a significant factor in the loss of cool season grasses and, as a result, a decline in range condition scores. This is supported by Parker Three-Step Cluster data from the exclosure on this allotment as well as a relic area on the Hat Allotment that has never been exposed to livestock grazing. Data collected from both sites shows similar declines in cool-season grasses and a decline in range condition and trend.

The results of the 2007 monitoring indicate an overall static trend in range condition and an upward trend in soil condition as supported by exclosure data. The exclosures mentioned above do not show a difference inside and outside the exclosures. From 1996 to 2007, during a drought period, cool season grasses have declined while warm season grasses and ground cover have increased.

These range condition trends exist under the current livestock grazing system and within the current utilization guideline for livestock and wildlife. Grazing has remained within this utilization guideline and when grazed, livestock have been able to use the area for the full length of the grazing season. Livestock must be moved early if the grazing intensity level is reached prior to planned rotations, or may not enter an area if grazing intensity from wildlife already meets the grazing intensity guideline.

5. Management Strategy

Livestock grazing is authorized on the Pine Creek Allotment under the terms and management prescriptions described below.

Permitted livestock would remain at 250 yearling cattle or the equivalent of 133 adult cattle (cow/calf), from June 1 through October 31 (days of use =154; 1,266 HM's or 886 AUM's). Forage utilization standards will allow up to 35% use by cattle and/or wildlife during the grazing season. Cattle will move to the next pasture when grazing intensity approaches a conservative level (40%) anytime prior to August 30 to ensure adequate time for plant regrowth.

The current utilization¹ guideline would continue to allow up to 40 percent use by livestock and/or wildlife at the end of the grazing season. This includes "conservative" grazing intensity which is measured before the end of the growing season and is used in determining when livestock need to move to the next pasture, in consideration of other factors such as weather patterns, likelihood of plant regrowth, and previous years' utilization levels. Livestock would move off a pasture when grazing intensity approaches a conservative level (40%) before August 30. This area would not be grazed again during the grazing season.

Livestock effects to Three Mile Lake would use adaptive management techniques (primarily deferred grazing) to mitigate effects to the seasonal wetland and wildlife habitat. Livestock use of the South Pasture will be deferred to avoid utilizing this area when there is standing water in the wetland. If other pasture options within the allotment or even outside the allotment were not possible, then a nest survey would be performed in and around the dry wetland area to insure no nesting wetland birds would be impacted by livestock grazing. If nesting was occurring, the nest areas would be deferred, either by temporary fence or complete pasture deferment.

The stock tank within this seasonal wetland will not be maintained.

¹ Utilization is the proportion or degree of current year's forage production that is consumed or destroyed by animals (including insects). It is a comparison of the amount of herbage left compared with the amount of herbage produced during the year. Utilization is measured at the end of the growing season when the total annual production can be accounted for, and the effects of grazing in the whole management unit can be assessed. Utilization guidelines are intended to indicate a level of use or desired stocking rate to be achieved over a period of years.

Adaptive Management

This AMP includes the continued use of adaptive management, which provides more flexibility for managing livestock. Adaptive management allows the Forest Service to adjust the timing, period and occurrence of livestock grazing, movement of livestock within the allotment, and livestock numbers. If adjustments are needed, they are implemented through the Annual Operating Instructions, which would adjust numbers so use is consistent with current productivity. This allows plant, soil, and watershed conditions to be maintained or improved while range improvements are implemented over time. An example of a situation that could call for adaptive management adjustments is drought.

Adaptive management is designed to provide sufficient flexibility to adapt management to changing circumstances. If monitoring indicates that desired conditions are not being achieved, management will be modified in cooperation with the permittee. Changes may include administrative decisions such as the specific number of livestock authorized annually, specific dates of grazing, or modifications in grazing rotations, but such change will not exceed the limits for timing, intensity, period, number, occurrence and frequency of livestock grazing defined in this AMP.

6. Resource Protection Measures

- 1) Manage grazing intensity to not exceed Conservative Use category during the growing season, and to not exceed Conservative Use category at or near the end of the growing season when the potential for plant regrowth is limited. These grazing intensity categories can be exceeded in limited areas where livestock concentrate: a) within 1/4 mile of water developments (including temporary water hauls) and salt and supplement stations; and b) within 1/10 mile of pasture gates.
- 2) Consider a variety of factors related to drought when making decisions on annual authorization of livestock numbers and grazing period, including: a) amount and timing of current-year and previous-year precipitation received at weather stations nearest to each allotment, b) current-year and previous-year forage production as they contribute to current standing forage, c) estimates of current-year and previous-year grazing intensity, d) current and projected amount and distribution of water available to livestock (Howery 1999, Forest Service 2006).
- 3) Permittees must distribute livestock throughout the suitable grazing areas using appropriate methods, including placement of salt and supplements, water hauling, and herding.
- 4) Follow applicable Best Management Practices for range management from the *Soil and Water Conservation Practices Handbook* (Forest Service Handbook [FSH] 2509.22) to minimize soil and watershed impacts caused by livestock grazing and grazing management activities.
- 5) Follow applicable direction in the *Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds* (Forest Service 2005a; pages 281-282) to minimize the risk of new weed infestations caused by livestock grazing and grazing management activities.

Relevant direction includes: a) Consider weed prevention and control practices in the management of grazing allotments; b) Minimize transport of weed seed into and within allotments; c) Maintain healthy, desirable vegetation that is resistant to weed establishment; d) Minimize ground disturbance; e) Promote weed awareness and prevention efforts among range permittees.

7. Monitoring

Two general categories of monitoring would be conducted: implementation monitoring and effectiveness monitoring. Implementation monitoring determines whether resource protection measures and management practices detailed in the Forest Plan, allotment management plan, and annual operating instructions are implemented. Relevant components of the proposed action detailed in this NEPA document will be incorporated into the term grazing permit, allotment management plan, and annual operating instructions. Implementation monitoring includes determination of range readiness, evaluation of grazing intensity, estimation of forage production, evaluation of rangeland use, and grazing capacity determination (Forest Service 1997: pages 4-3 to 4-8).

The Forest Service and/or the Permittee will monitor grazing intensity in each year grazed at least once a year. Various methods will be used to evaluate grazing intensity, including one or more of the following: determination of forage utilization, amount of forage standing crop remaining at the end of the grazing cycle, percentages of grazed and ungrazed plants, plant stubble heights, litter or carryover vegetation from previous years, and visual appearance (Holechek and Galt 2000, Holechek and Galt 2004, Holechek et al. 2004: pages 195-196 and 248-251).

In addition to implementation monitoring conducted by the Forest Service, the permittee will be encouraged to help monitor grazing intensity and avoid exceeding grazing intensity levels specified above in Resource Protection Measures #1. Coordination between the permittee and the Forest Service will be encouraged to help the permittee accurately determine grazing intensity. In addition, the permittee will be encouraged to provide the Forest Service with actual use records at the end of each grazing season, including 1) livestock number; 2) grazing period; and 3) estimate of average grazing intensity at key areas on departure from grazing areas.

Effectiveness monitoring determines whether management practices are effective in moving the allotment toward desired conditions. Effectiveness monitoring is designed to determine the trend toward or away from desired conditions for vegetation resources, soil and watershed resources, and wildlife resources.

Long-term trend monitoring will be conducted at the historic Parker transect on the allotment every 5 to 10 years or as funding is available. Paced transects sites will also be read to delineate vegetation condition classes and provide additional data on composition, vigor, cover, and soil conditions over the larger area. During the next reading of these monitoring sites plant frequency and ground cover plots may be used to estimate trend, dry weight rank method will estimate relative species composition by weight, and species composition will be estimated by 1/10 acre canopy cover plots.

Data collected from both implementation monitoring and effectiveness monitoring will be continually evaluated by rangeland range staff and other Forest Service resource managers (e.g., wildlife biologist) to assess whether changes in allotment management are needed to achieve desired conditions and objectives.

Monitoring is adaptive, and as improved methods are developed these new methods will be considered. Historic monitoring could be adapted to include these improved methods. Depending on the availability of funding, the type of monitoring and frequency for the monitoring would include: visual observations to be conducted during a grazing period to include permittee compliance, allotment inspections, range readiness, forage production, and rangeland utilization.

8. Grazing Capability and Grazing Capacity

An analysis of grazing capability and grazing capacity was conducted on the Pine Creek Allotment in 2008. See Tables 4 and 5 for Capacity Classification by TES Map Units and Acres, respectively, on this allotment. Grazing capability of a land area is dependent upon the interrelationship of the soils, topography, plants and animals. Grazing capability is expressed as one of three capacity classes:

Full Capacity (FC) – areas that can be used by grazing animals under proper management without long-term damage to the soil or vegetative resource. They must also produce a minimum of 100 pounds per acre of forage and are on slopes less than 40 percent.

Potential Capacity (PC) – areas that could be used by grazing animals under proper management but where soil stability is impaired, or range improvements are not adequate under existing conditions to obtain necessary grazing animal distribution. Grazing capacity may be assigned to these areas, but conservative allowable use assignments must be made.

No Capacity (NC) – areas that cannot be used by animals without long-term damage to the soil resource or plant community, or are barren or unproductive naturally. In addition, it includes areas that produce less than 100 pounds per acre of forage and/or are on slopes greater than 40 percent. Grazing capacity is not assigned to sites with a “no capacity” classification.

Table 4. Grazing Capacity Classification by TES Map Unit, Pine Creek Allotment

TES Map Unit	Capacity	Acres
010	Full	104
020	Full	17
310	Full	76
311	Full	179
401	Full	131
402	None	40
405	Full	401
406	None	351
495	Full	147
496	None	433
507	Full	3,555
514	Full	836
519	Full	64
525	Full	56
537	Full	100
563	Full	669
564	Partial	772
565	Full	443

Grazing capacity is a function of grazing capability, forage production, proper use by livestock, and the level of management that may be applied. This analysis used forage production and grazing capability to determine the estimated grazing capacity of the allotment. Forage production estimates were taken on the allotment. Production data from the Terrestrial Ecosystem Survey (TES) was used for any data gaps. An allowable use standard of 40 percent was used on the Full Capacity acres within the allotment, 20% on Partial Capacity, and zero for No Capacity.

This analysis revealed that under current management, permitted livestock are utilizing:

- 47% of the estimated grazing capacity on the Pine Creek Allotment,

In terms of total estimated forage production, permitted livestock are utilizing:

- 18% of the estimated forage produced on the Pine Creek Allotment,

This analysis indicates that the current permitted livestock numbers are within the estimated grazing capacity of these allotments (Table 5).

Table 5. Grazing Capacity for the Pine Creek Allotment.

Grazing Capacity Estimates By Allotment	Pine Creek
A) Forage Required by Permitted Livestock	708,800 pounds (886 AUM's)
B) Grazing Capacity (FC & PC acres only with established utilization standards)	1,507,920 pounds (1,885 AUM's)
C) Total Estimated Allotment Forage Production (FC, PC, and NC acres)	4,037,101 pounds (5,046 AUM's)
D) Forage required by permitted livestock as a percentage of the Grazing Capacity (A÷B)	47%
E) Forage required by permitted livestock as a percentage of the Total Allotment Forage Production (A÷C)	18%

An AUM (Animal Unit Month) is amount of forage required by an animal unit for one month; approximately 800 pounds/AUM.

9. Range Improvements

1) Existing Structures

Range improvements (Fencing, waters, handling facilities, etc.) are critical components of any grazing management plan. All range improvements assigned to the permittee (shown in Table 6) need to be maintained in order to facilitate proper management of the allotment.

Permittees are required to follow the District's Heavy Equipment Policy prior to beginning any ground disturbing activities which may require an archaeological survey and/or wildlife clearances.

2) New Construction

No new range improvements have been identified in the NEPA process for the Pine Creek Allotment.

Table 6. Improvement Maintenance Responsibility for the Pine Creek Allotment

Improvement Name	Improvement Number	Units in Place	Maintenance Responsibility
Hwy 64 ROW Fence	7621	4.0	ADOT
AT&SF Railroad ROW Fence	7626	5.0	AT&SF Railroad
Northeast/South Pasture Fence	7707	2.0	Grazing Permittee
West Pasture Fence	7708	1.5	Grazing Permittee
Smith/Northwest Pasture Fence	7709	1.25	Grazing Permittee
I-40 ROW Fence	7738	1.0	ADOT
Stump Tank	7752	1	Grazing Permittee
Pine Creek Pipeline	7832	2.0	Grazing Permittee
Three Mile Tank	7919	1	Won't be maintained
Pine Tank	7920	1	Grazing Permittee
Pen Tank	7921	1	Grazing Permittee
Pronghorn Tank	7922	1	Grazing Permittee
Pipeline Tank	7923	1	Grazing Permittee
Pronghorn Waterlot Fence	7926	1.0	Grazing Permittee
Pine Creek/Forest Bdry Fence	7927	4.5	Grazing Permittee
Prairie Dog Tank	7975	1	Grazing Permittee
Kaibab Lake Fence	7976	2.0	USFS
Lake Water Trough	7977	1	Grazing Permittee
Pen Tank Waterlot Fence	7978	0.5	Grazing Permittee
Airport Exclosure Fence	8003	2.0	City of Williams

10. Flexibility/Adaptive Management

It is imperative that flexibility and adaptive management be considered when following this allotment management plan. Adjustments to the grazing period may be necessary due to weather constraints (i.e. precipitation patterns favor or do not favor certain portions of the allotment), or management activities in an allotment (P/J treatment or prescribed burning).

There may also be a need to vary livestock numbers to meet objectives. Drought may force the reduction of livestock numbers while on the other hand additional numbers above term permit may be appropriate in certain situations.

11. Travel Management

The Kaibab National Forest has actively pursued a road closure program for the last several years. This program is aimed at reducing non-essential roads for watershed protection and to decrease disturbance to wildlife. These closures must also be honored by the Permittees.

If you need to enter a motor vehicle restricted area, you must have special authorization in the form of an Off-Road Vehicle Permit or specific authorization through your Annual Operating Instructions. Entering a restricted area without authorization is a violation of 36 CFR 261.

Additionally, the Williams Ranger District is currently planning the implementation of the Travel Management Rule, as directed by the Washington and Regional Offices of the Forest Service. The end product of the Travel Management Process will be a map of roads open to public travel. All other roads will be closed to the public and cross country vehicle travel will be prohibited across both districts. Many roads that will not be open to the public may remain open to Forest Service employees and grazing Permittees for administrative purposes. Access for Permittees will be refined during the Travel Management Process and in **Annual Operating Instructions**.

